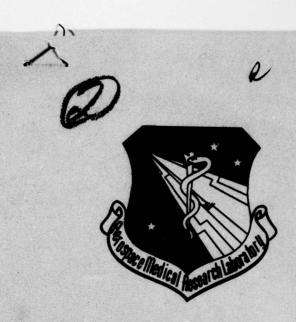


AMRL-TR-75-50 Volume 110



USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK



Volume 110

A/M27T-2 Test Stand, Aircraft System, Electric Motor-Driven

NOVEMBER 1977

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AEROSPACE MEDICAL RESEARCH LABORATORY AEROSPACE MEDICAL DIVISION AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

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FOR THE COMMANDER

HENNING E. VON GIERKE

Director

Biodynamics and Bioengineering Division Aerospace Medical Research Laboratory

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BEFORE COMPLETING FORM REPORT DOCUMENTATION PAGE 2. GOVT ACCESSION NO. AMRL-TR-75-50 - VEL -110 USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK, Volume 110 of a series A/M27T-2 Test Stand, Aircraft System, 6. PERFORMING ORG. REPORT NUMBER Electric Motor-Driven. 8. CONTRACT OR GRANT NUMBER(s) Richard W. Gorman Nick A./Farinacci PERFORMING ORGANIZATION NAME AND ADDRESS 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS Aerospace Medical Research Laboratory 7231-04-33 Aerospace Medical Division, Air Force Systems 62202F 7231-04-36 Command, Wright-Patterson AFB OH 45433 11. CONTROLLING OFFICE NAME AND ADDRESS Nove Same as above 18 15. SECURITY CLASS. (of this report 14. MONITORING AGENCY NAME & ADDRESS(If different from Controlling Office) Unclassified 15a. DECLASSIFICATION DOWN 16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) 18. SUPPLEMENTARY NOTES 19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Noise Environments Bioenvironmental Noise Ground Support Equipment A/M27T-2 Test Stand, Aircraft System, Electric Motor-Driven 20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Hydraulic Test Stand is an electric motor-driven unit designed to test aircraft hydraulic systems. This report provides measured data defining the bioacoustic environments produced by this unit operating inside a large aircraft hanger at normal rated conditions. Near-field data are reported for 37 locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times

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PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under the Project/Task 723104, Measurement and Prediction of Noise Environments of Air Force Operations.

The author acknowledges the efforts of Mr. Robert G. Powell who assisted the field measurements, and Mr. John N. Cole who established the data analysis requirements and assisted in the preparation of this report. Mr. Henry Mohlman and Mr. David Eilerman of the University of Dayton assisted in the mechanics of data processing, and Mrs. Norma Peachey typed and prepared the graphics.

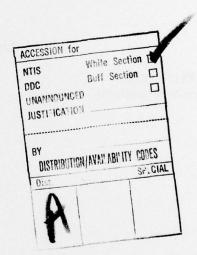


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INTRODUCTION

The A/M27T-2 Hydraulic Test Stand is an electric motor-driven unit designed to test aircraft hydraulic systems.

This volume provides measured data defining the bioacoustic environments produced by this unit. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with operations of the A/M27T-2 test stand.

This volume is one of a series published by the Aerospace Medical Research Laboratory (AMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type, noise data in the handbook describe the noise produced during ground operations of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Volume 2 provides a method and data for adjusting the handbook's far-field noise data, which are for standard meteorological conditions (15C temperature, 70% rel humidity, 0.760 meters Hg barometric pressure) to derive comparable data for other meteorological conditions. Refer to Volumes 1 and 2 (references 1 and 2) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published, and is available upon request from AMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of the updated index as it is generated.

Direct any questions concerning the technical data in this report and other handbook volumes to: AMRL/BBE, Wright-Patterson AFB, OH 45433; Autovon 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

Cole, John N., USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content and Application, AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

Cole, John N., USAF Bioenvironmental Noise Data Handbook, Volume 2: Procedure to Evaluate Effects of Non-standard Meteorological Conditions on Far-Field Noise, AMRL-TR-75-50 (2), AMRL, WPAFB, OH, 1975.

NEAR-FIELD NOISE

MEASUREMENTS

A standard A/M27T-2 test stand was operated inside and approximately in the center of a large aircraft hanger (190.5 m long x 95.1 m wide x 18.3 m high) on a concrete floor at a normal rated condition of the system pressurized at 3000 PSI, no flow. No far-field acoustic data were acquired because of the relatively close proximity of the hanger walls.

Figure 1 identifies 36 noise measurement locations at a height of 1.5 meters above the concrete apron (nominal ear level of ground crew). The 0 degree reference direction passes through the tow bar. These locations are in the acoustic near-field of the source where the sound wave fronts generally do not spherically diverge and the source appears to be spatially distributed (i.e., not a point source). Consequently, these near-field data cannot be extrapolated to longer distances but do properly define the levels at locations close to the unit.

Near-field measurements were also made at ear level at the operator control panel. Table 1 lists the numeric/alphabetic designator used on the data pages in this report to identify the operator measurement location and test condition. The designator 1/A means operator location 1 and test condition A. Such a descriptor is essential in many handbook volumes that involve multiple combinations of location conditions. It is used in this report to maintain format consistency.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced by the A/M27T-2 unit at the 37 specified, near-field locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data one can calculate the variety of measures in Table 3 which are widely used to assess the effects of noise on personnel and their performance.

For data at other intermediate near-field locations (i.e., for radial distances less than 4 meters) you can interpolate between the 36 measured data points.

TABLE 1

MEASUREMENT LOCATION AND TEST CONDITION FOR OPERATOR NOISE MEASUREMENTS

A/M27T-2 Test Stand, Aircraft Hydraulic System, Electric Motor-Driven Edwards AFB, 10 May 1977

Measurement Location

1

Operator Control Panel

AGE Operation

A

System Pressurized at 3000 PSI, No Flow

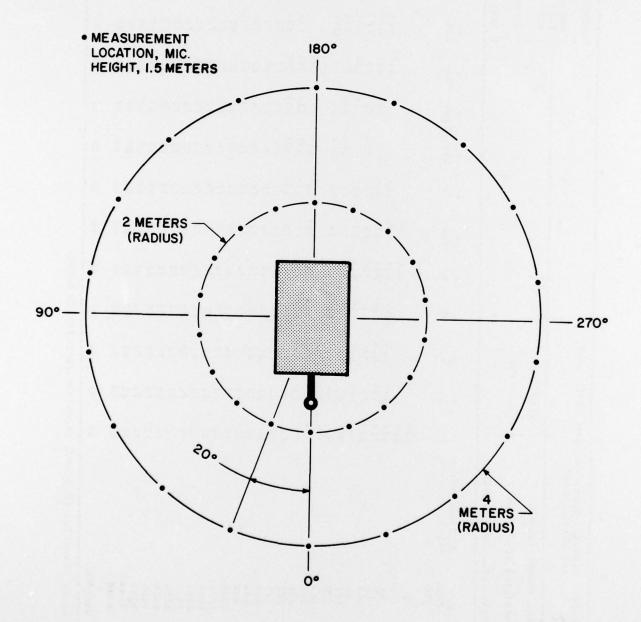


Figure 1. Measurement Locations

7 7	TAVE			BAND									OME	OMEGA 3.2	3.2
NOISE SOURC	SOURCE/SUBJECT:		1 OP	OPERATION:	8 N C			~					RUN	110	- 90
A/M271-2	A/M271-2 TEST STAND			3000 PSI	ISC								101	10 MAY 77	
. 7	D NOISE LEVELS	S) PAGE	E F1	
	DISTANCE (M)			,	ŧ	ę	4	,	t	,	,	,	,	,	,
FREQ	ANGLE (DEG)>			20	3	0	3	100	150	140	160	183	200	220	240
25			504												614
31.5			>99				> 49	9							>99
0 4			234	>+9	>00	>+6	63<	634	>49			9+9	959		634
26			114	>69	>69	204	204	>69	>99	,	654	×69	>19	>+9	>99
63			81	5.	11	62	61	62	9	724	52	2	11	52	12
300			>00	V+0	× 60 0	9 34	200	634	924		034	200	>/9	634	279
136			20	70	70	77.	221	× 2 2	2 0	227	126		77	***	>21
160			704	704	704	700	70	†	00	*	00	9 4	.10	1	200
200			714	68<	684	>99	67 c	999	>99	>59		654		9	999
250			62	734	15	>60	22	724	714	>69	576	684	714	>19	724
315			92	80	92	73	4.2	7.0	>69	>69	>69	>69	>69	20	>19
004			80	81	11	92	92	4.2	73	7.1	7.2	73	22	73	73
200			90	93	81	96	90	91	85	84	7.8	95	83	93	94
636			+6	85	81	9 8	62	82	11	7.8	7.	83	92	83	7.8
900			81	28	11	73	20	20	20	7.1	20	2.0	22	20	7.1
1900			3.0	83	†	80	81	80	90	7.8	88	81	85	82	87
1250			25	78	62	7.8	4.	73	11	1.	90	4.2	11	15	18
16.0			83	81	81	52	7.8	96	79	82	7.8	62	11	29	82
2000			29	62	81	73	92	62	28	83	62	83	81	7.8	81
2500		-	62	62	78	73	70	4.2	11	11	7.4	92	92	15	77
3150			11	7.8	20	14	73	72	73	73	72	72	72	22	73
0004			9.2	18	11	15	7.5	73	73	73	75	7.2	73	1.4	72
5000			73	73	72	60	68	99	69	69	69	69	69	69	99
6306			1.1	11	7.1	68	20	99	29	99	69	99	99	69	68
9700			20	11	69	99	69	69	65	29	29	99	20	69	49
10000			90	2.0	0.2	9 9	62	69	99	9.9	29	99	9.0	99	69

2 1/3 OCTAVE	BAND) OMEGA 3.2		
NOISE SOURCE/SUBJECT		OPERATION:	I ON S			~					RUN	20	-006-091
A/M271-2 TEST STAND		3000 PSI	PSI								1 10 1	10 MAY 77	
NEAR FIELD NOISE L	EVELS (PAGE	E F2	
S	Î	,	4	t	,	2	2	2	2	٧.	۶	2	2
FREQ ANGLE (D	111	280	300	320	340	•	50	0 1	0.9	90	100	120	140
77un													
25				28		634	614	614		264	>09	>65	9
31.5	>99		654	999	999	674	> 29	299	>99	> 29	959	>99	
01			959	999	634	>69	>69	68	>29	929	959	> 29	99
50	674	>69	×69	724	724	7.8	78	75	734	124	>60	68 <	714
63	77		43	81	82	88	89	82	83	81	80	4	81
96	go		634	6 8×	929	714	114	9 e	73	634	634	63<	634
100	60		724	62	85	87	87	83	80	717	734	734	9
125	78		83	8.8	35	98	97	34	91	81<	83	83	744
166				576	>69	18	11	>+/	714	>99	>29	> 29	67 <
230	>60		68	204	734	7.8	11	734	714	724	>69	204	68
250	99		70	7 8	82	19	13	28	734	62	744	72<	704
315	19		75	92	62	83	*	90	92	7.7	72	73	72
100	1.4		70	11	82	99	99	83	11	1.4	92	14	75
500	98		16	9 6	103	91	104	68	90	93	95	91	90
630	00		82	8 9	93	60	65	83	82	94	83	85	82
800	70		72	11	62	9 4	82	81	92	52	7.4	47	92
1000	62		11	82	82	06	91	9,4	85	86	83	81	87
1250	73		73	7.8	9.2	82	† 0	62	28	28	22	92	80
1606	70		11	82	81	96	88	81	62	95	81	87	82
2006	12		90	82	83	85	85	*8	80	81	83	85	80
2506	73		25	7.8	62	84	81	81	62	62	62	80	28
3150	73		73	15	9/	82	62	11	8.2	18	92	92	11
0000	72		14	92	92	82	80	7.8	8.2	8.2	7.8	92	77
5000	19		20	7.1	73	7.8	11	22	1.4	1/	4.2	73	25
6306	65	99	9	69	70	92	1.4	73	72	73	7.1	7	73
8000	63		9	19	69	1.4	73	76	7.1	7.1	69	7.0	72
10,00	62		65	69	29	7.5	73	92	72	11	0.2	69	72
OVERALI	6	3	86	190	134	101	106	86	96	95	9	95	10

		BAND									OMEGA	3.2
NOISE SOURCE/SUBJECT:	0	OPERATION:	O			~ -					RUN	3 -
A/M271-2 TEST STAND		3000 PSI	PSI								10 MA	MAY 77
NEAR FIELD NOISE LEVELS											PAGE	F3
UISTANCE (M) ->		8	8	2	2	8	8	8	7		OPERATOR	POSITION
FREG ANGLE (DEG)>	160	180	203	220	240	260	280	300	320	340		44
25	>09	614					61<	>09		> 0 9		92<
31.5		>09	>40		>19	>99	684	>69	>10	>99		>99
2,7	>69	>99	959	949	>09	>49	9	>90	>69	684		>02
20	714	724	714	>69	68 <	>69	714	724	734	92		52
63	81	82	81	78	92	28	80	85	83	9.		18
3 0	240	654	654	¥ 0	65	924	654	654	> 29	>02		>69
136	9 2	20	*2	750	>7)	787	25.	0 0	700	000		
160	714	734	704	674	270	>69	684	269	724	774		29
200	704	724	684	999	684	684	714	724	92	80		62
250	704	75	>02	704	717	724	62	81	9.4	87		62
315	11	2.	7.0	7.1	>69	2.0	73	15	62	84		92
004	70	92	1.	92	15	15	92	62	81	88		81
200	88	90	95	91	89	95	93	93	95	101	1	00
630	82	81	20 1	1 00	81	40	9 1	\$ 6	90	26		06
	0 3	0 0	200	000	2 3	0 3	0 0	0 6	2 9	2 10		70
1250	6 6	8 9	8 2	200	40	* 0	0 X	82	* 0	8 0		0 0
1600	83	8 6	82	87	84	85	9	85	90	y 30		96
2000	87	91	89	88	81	81	82	82	90	82		66
2500	84	84	83	81	11	62	62	62	6.2	81		95
3150	11	80	70	11	92	11	8.2	11	11	62		86
7000	7.8	80	11	11	92	11	20	11	92	8.0		88
2000	11	92	14	1.4	73	73	1.4	73	73	11		85
6300	1.4	7.8	11	7.4	11	7.1	7.1	7.1	7.1	4.2		88
8000	14	1.4	73	73	69	20	20	20	7.3	1.4		87
10000	72	73	73	7.5	89	68	99	89	11	92		88

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE! HE	OUND	SSUR	PRESSURE LEVEL (DB)	(09)								LOEN	IDENTIFICATIONS	110N:
I NOISE SOURCE/SUBJEC	SOURCE/SUBJECT:	J.,	OPERATIONS	iNO			~ ^ ^						RUN 01	100-00
NEAR FIELD NOISE	D NOISE LEVELS			į į								PAG	PAGE J1	
FREQ	DISTANCE (M) ->	* 0	50	+ 3	e a t	\$ °	100	120	110	160	185	200	220	540
(HZ)		69				20	29							69
63		81	62	200	9 0	42	90	11	•	200	62	7.8	15	92
250		81	8 1	200	12	282	12	4 2	23	2.7	22	73	73	142
2000		91	9 4	30 a	96	6.0	95	0 0	0 0	20 0	92	* 1	93	85
2000		82	8 6	œ 2	78	9 10	10	9 0	9 9	82	0 00	8 6	95	87
0004		91	81	80	7.8	70	92	11	92	11	92	11	8.2	92
8900		*	15	15	73	20	20	20	75	7.5	1	72	73	2
OVERALL		26	26	66	26	95	16	95	06	95	6	06	76	95

TABLE! HE	OND ON	SSUR	PRESSURE LEVEL (DB)	(03)) I DEN	OMEGA 3.2	TIONS
NOISE SOURCE/SUBJEC	URCE/SJBJECT:	J.	OPERATIONS	NO S			~					SE SE	05	
A/H271-2 TEST STA	TEST STAND		3000 PSI	PSI								1 2	10 HAY 77	
NEAR FIELD NOISE	D NOISE LEVELS) PAG	E J2	
	DISTANCE (M) ->	,	,	,	•	,	8	~	~	~	~	~	8	~
FREG	ANGLE (DEG)>	200	280	300	320	346	•	20	•	0.9	99	100	120	140
31.5			69	19	69	99	72	77	7.0	7.0	20	69	20	67
63		78	62	9 0	81	82	88	88	85	83	82	80	79	82
125		10	78	63	6 9	26	96	96	*	91	81	83	94	75
550		72	22	62	8 0	9 4	85	85	83	78	80	11	92	75
200		60	93	91	66	104	16	104	91	91	93	93	95	91
1000		90	7.8	62	96	62	95	95	87	96	87	9.4	83	88
2000		62	81	82	9 8	90	68	90	87	84	85	98	68	85
4000		10	92	11	4	9	98	83	82	82	82	91	90	81
8000		80	69	11	73	73	62	1.6	90	92	92	52	52	11
OVERALL		96	*6	93	100	104	101	106	36	96	20	96	9	40

CARTERIAL P

2	MEASURED SOUND OCTAVE BAND	PRE	SSURE	OUND PRESSURE LEVEL (08)	(09)) IDENTIFICATIONS) ONEGA 3.2
NOISE SOURCE/SUBJEC	CE/SUBJECT:		0	OPERATION:	. NO			~) TEST 77-005-001
A/H27T-2 TEST STA	TEST STAND			suuo PSI	PSI) 10 MAY 77
NEAR FIELD NOISE	D NOISE LEVELS	LS.						^ ^) PAGE J3
	DISTANCE (M) ->		2	~	~	8	8	~	~	8	~	8	OPERATOR POST
FREU (HZ)	ANGLE (DEG)		100	180	200	22 €	240	260	280	300	320	340	¥
31.5			29	2.0	9		69	99	0.2	69	69	7.0	72
63			81	82	81	62	11	7.8	80	82	70	96	48
125			87	89	83	62	81	62	82	88	93	96	91
250			52	11	14	4.2	14	22	81	82	85	69	83
905			96	06	95	36	6	93	46	93	96	101	100
1000			90	90	35	91	68	98	68	91	98	88	26
2000			96	93	91	91	98	87	87	87	88	87	101
4000			82	9 4	0.1	81	80	81	82	81	80	83	91
9000			82	80	80	11	7.5	15	15	1,4	92	79	92
OVERA					Č		2			;			

3											ONEGA	4	N.
NOISE SOURCE/SUBJECT!	3	OPERATIONS	. NO			~					RGN	=======================================	100-00
A/H27T-2 TEST STAND		3000	PSI								10	MAY 77	
NEAR FIELD NOISE LEVELS											PAGE	E H1	
DISTANCE (M) -> ANGLE (DEG)>	40	50	100	4.0	4 8	100	120	140	160	180	200	220	240
WJPROTECTION -MEIGHTED OVERALL -MEIGHTED OVERALL MAXIMUM PERMISSIBLE	SOUND LEVEL SOUND LEVEL TIME (T IN		COASLC I COASLA I MINUTES)	IN DBC) IN DBA)	A A T	SURE	PER DAY	(AFR	161-35,	איטטר	73)		
NO PROTECTION OASLC	16	26	95	97	91	46	95	96	95	95	06	76	95
DASLA	***	6 6	91	4 4	68	95	90	89	90	26	68	95	91
MINIMUM QPL EAR MUFFS	6	1	2	3	3	1	•	,			707	771	2
	12	75	72	14	68	2.0	99	49	29	7.1	69	20	99
	σ,	096	96	096	960	096	996	096	096	960	096	960	960
AREKICAN UPITCAL 1700 EA	AX 307	69	29	6.8	95	7.9	63	29	95	90	9	79	9
_	960	96	960	960	096	960	960	096	096	960	96	960	960
V-51R EAR PLUGS OASLA*	20	7.0	9	72	65	29	65	95	65	89	9	69	99
1700	960	096	960	960	096	096	960	900	096	961	960	096	960
			53			52	25	48	53	52	51	53	53
T COMMINATOR	960	6	960	960	960	096	960	096	096	096	096	096	960
	67	65	9	63	9	62	63	61	40	9.5	62	61	40
	960	960	900	096	96	096	096	960	960	096	096	960	96
COMMUNICATION PREFERRED SPEECH INTE PSIL	INTERFERENCE 89	E LEVEL 88	IL (PSIL 85	IL IN	94	98	85	*	4	0	:	99	98
ANNOYANCE PERCEIVED NOISE LEVEL,	TONE	CORRECTED (PNLT IN	TED (PNLT I	N PNDB)								
TONE CORRECTION (C IN PNI T	108	109	106	110	104	106	105	105	105	108	105	108	106

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NOISE SOURCE/SUBJECT!	ζ.	OPERATIONS	ONS			~					SES.	1 20	100-00
A/H27T-2 TEST STAND		3000	PSI								10	10 MAY 77	
NEAR FIELD NOISE LEVELS						^ ^) PAGE	E H2	
E (M) -> DEG)>	7 Ter	280	300	320	3 \$ 6	0.0	20	6.0	60	80	2 10 u	120	140
HAZARD/PROTECTION C-NEIGHTED OVERALL SOUND A-M-TGHTED OVERALL SOUND	LEVEL		COASLC IN	080	AT EAR								
w	:			200	N N		PER DAY	CAFR	161-35	, JULY	73)		
OASLC	90	16	93	100	104	101	100	26	95	66	35	46	76
OASLA	88	91	06	26	101	26	102	93	95	93	93	93	93
MINIMUM OPL EAR MUFFS	747	143	7,7	2	ç	2	7	101	150	101	101	101	101
	99	20	2.0	10	81	62	83	75	72	11	7.1	7.0	69
5	960	096	96	906	807	096	571	960	096	n96	096	960	960
AMERICAN OPTICAL 1700 EAR	AUFF 61	S 64	4	7	75	7.3	77	7.0	19	1	65	49	4
6	960	960	360	960	960	960	960	960	960	960	96	960	960
V-51R EAR PLUGS	N.	9		1,6		:							
	00	0 0	000	*	200	210	9 0	000	0 0	200	0 0	000	0 0
PTICAL 1700 EAR	MUFF	S	" >	EAR	PLUGS	306	706	200	196	900	200	960	796
OASLA*	64	25	21	28	9	29	49	25	24	24	53	53	24
H-133 GROUND COMMUNICATION UNIT	NO N	960	960	969	960	000	196	960	996	096	096	096	960
	99	69	9	9	99	20	7.1	99	90	10	63	19	79
Ē	960	960	96	96	960	960	960	960	960	969	096	960	960
COMMUNICATION PREFERRED SPEECH INTERFERENCE	RENC	E LEVEL	L (PSIL	Z	08)								
PSIL	83			9.0	16	95	96	88	87	9 9	99	88	88
ÆL,	TONE	CORREC	TEO (P	NLT I	CORRECTED (PNLT IN PNDB)								
2 2	103	106	100	113	112	112	116	109	108	109	109	109	108

m											OMEGA 3.2
NOISE SOURCE/SUBJECT!	<u>.</u>	OPERATIONS	. NO			^ -					2
A/H271-2 TEST STAND		3660	PSI								10 MAY 77
NEAR FIELD NOISE LEVELS											PAGE H3
DISTANCE (M)-> ANGLE (DEG)>	2 2 2 4 160	181	200	220	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	260.	2 280	3 6 6	320	2 OPER	OPERATOR POSITION
	UND LE			IN 08C)							
~"	SOUND LE	CE IN MIN	(OASLA I Minutes)	z "	-	URE	PER DAY	CAFR	161-35,	, JU_Y 73)	2
DASLC	35	16	96	96	93	96	96	26	66	103	105
OASLA	*	96	26	96	26	66	95	95	95	66	105
MINIMUM QPL EAR MUFFS	60	8	2	•	7	1	:	:	:	2	3
	11	72	73	7.0	99	7.0	72	73	92	8.0	6.2
		T	96	950	096	096	96	960	960	950	096
AMERICAN OPTICAL 1700 E	EAR MUFI	ES.	23	u	7.5	7,5	4	23	20	1,6	7.7
1	960	360	366	960	36.	096	360	796	900	696	096
V-51R EAR PLUGS											
OASLA*	99	20	12	10	19	69	7.6	11	72	11	78
T AMELICAN COTTON	900	096	960	•	96	960	696	960	960	096	096
3				,		24	20	25	20	61	49
_	960	9	900	960	96	960	360	960	960	096	096
ND COMMUN	ICATION UNIT							,			
UASLA+	906	696	96.0	996	966	796	960	960	960	900	960
COMMUNICATION PREFERRED SPEECH INTE	INTERFERENCE		EL (PSIL		083						
	60	91	93	91	87	8 9	9.0	96	9.0	95	66
ANNOYANCE PERCEIVED NOISE LEVEL, TONE CORRECTION (C IN	EVEL, TONE		CTED (PNL 1	CORRECTED (PNLT IN PNDB)						
?	7	113	113	111	106	108	109	110	110	114	121
	1	1	ď	1	~	1	4	4	~	2	7